The Seychelles Magpie Robin: first steps on the road to recovery

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The predominantly Asian genus of chats *Copsychus*, which includes the familiar Shamas and Indian Magpie Robin *Copsychus saularis*, also contains two species occurring in the Afro-Malagasy region. These are the Magpie Robins of Seychelles and Madagascar. While the latter species remains common in a range of habitats[6] the Seychelles species, *C. seychellarum*, the largest of the genus, is currently one of the most endangered birds in the world[1]. Once reduced to only around a dozen individuals on 210 ha Fregate Island the Seychelles Magpie Robin is staging an encouraging recovery as a result of a rescue programme being carried out by BirdLife International in collaboration with the Seychelles Government and the owner of Fregate.

It is known that at the onset of continuous human settlement of the Seychelles archipelago in 1770 the Magpie Robin occurred on at least seven of the central granitic islands[2]. It is highly likely that the species inhabited all the granitic islands with tall forest but early biological records are scarce. The original habitat of the Magpie Robin appears to have been mature coastal forest where the closed canopy maintained an open, unvegetated leaf-litter in which the birds foraged for invertebrates and small reptiles. The large trees also provided holes for nest sites.

Having evolved in an environment free of terrestrial mammals the extremely confiding and predominantly ground-dwelling Magpie Robin was extremely vulnerable to the cats and rats which arrived with the early human colonists. The introduction of mammalian predators and the clearance of forest for plantation agriculture led rapidly to the species extinction on several islands.

By 1880 the Magpie Robin had disappeared from the largest island, Mahe. The species survived into the early years of the twentieth century on Marianne, Aride and Fregate, as did an introduced population established around 1890 on the coralline island of Alphonse[7]. During the following fifty years the Marianne, Aride and Alphonse populations all succumbed to predators and habitat destruction. This left only the birds on Fregate.

Magpie Robins on Fregate Island

The first estimate of the number of Magpie Robins on Fregate was not made until 1959 when only 20 birds could be found[3]. At that time cats had recently been introduced to the previously predator-free island and these were to have a dramatic effect. A census in 1965 could only find eight Magpie Robins and it is unlikely that the world population exceeded 12 birds[8]. Fortunately a combination of control measures and disease greatly reduced the cat population and Magpie Robin numbers recovered to 41 by 1978[10]. Soon after this the cats were finally eradicated.

Adult male Seychelles Magpie Robin *Copsychus seychellarum* at song perch, Fregate (Neil McCulloch)

Despite the removal of the cats the hoped for further increase in the Magpie Robin population failed to materialise. This situation was entirely due to the degraded state of the woodland habitat on Fregate. Around 200 years of plantation agriculture had resulted in the removal of 95% of the islands natural vegetation. The remaining, predominantly exotic, tree-cover produced a leaf-litter which supported few native invertebrates and much of the island was unavailable for foraging because of the development of thick undergrowth. The relatively small plantation trees also provided few good nest sites.

The Fregate population of Magpie Robins depended heavily on the management of the island for coconut production. Regular cutting of grass beneath the coconut palms to facilitate collection of fallen nuts maintained a short sward on which the birds could forage and the presence of a relatively large workforce on the island resulted in the cultivation of a substantial area of vegetable gardens where the Magpie Robins could obtain invertebrates from freshly turned soil.

Coconut palms also provided alternative nest sites in their crowns but these were often unproductive because of predation of eggs and chicks by arboreal native reptiles, which are common amongst the fronds, and by introduced Indian Mynas *Acridotheres tristis*. In this situation adult Magpie Robins were able to survive but they nested relatively infrequently and unsuccessfully. Recruitment was barely sufficient to compensate for mortality.

The situation worsened after 1982 when coconut production became uneconomic and the Fregate plantations were virtually abandoned. This led to encroachment of dense herbaceous growth under the palms and in most of the formerly cultivated areas. The result was a loss of approximately 50% of the most productive foraging areas and the Magpie Robin population underwent a corresponding decline. In the late 1980s numbers averaged around 20 individuals.

The Recovery Programme

It was obvious that the situation had reached a critical stage and that relatively small-scale local events could precipitate the extinction of the species. It was equally evident that the rehabilitation of a bird with a very low reproductive rate, the Seychelles Magpie Robin lays only a single egg at each nesting attempt, in an environment where the population already appeared to be at carrying capacity would not be easy. A two-year research programme was initiated in 1988 to investigate the biology of the Magpie Robin and identify possible ways of counteracting the threats to its survival[5]. On the basis of the information gathered during this study BirdLife International (then ICBP) launched a recovery programme in 1990 to tackle the major threats of low productivity, relatively high adult mortality and the limited extent and generally poor quality

Juvenile Seychelles Magpie Robin *Copsychus seychellarum*, Cousin Island, October 1995 (Neil McCulloch)

Juvenile (front) and adult Seychelles Magpie Robins taking cockroaches from feeding table, Fregate (Neil McCulloch)

of the existing habitat[9]. There were then 22 Magpie Robins.

The recovery project aims to increase Magpie Robin numbers on Fregate using techniques that will enable a larger population to be self-sustaining. The initial increase is being promoted by provision of supplementary food and artificial nest sites that can be protected against predators. It is hoped that habitat restoration through the planting of native woodland and suppression of invasive exotic vegetation will eventually raise natural food availability to a level that will allow supplementary feeding to be discontinued. A further long-term aim is to reduce the species vulnerability by re-establishing breeding populations on other islands within Seychelles.

Management Techniques and Results

Since the beginning of the recovery programme nesting Magpie Robins and those in the poorest territories have been supported by provision of additional food. In late 1992, however, a programme of daily feeding in all territories was begun. The birds are given freshly killed cockroaches equivalent to approximately 20% of their daily food requirement. This is sufficient to promote more frequent nesting and improve chick survival but does not significantly disrupt natural foraging behaviour. During the period of supplementary feeding pairs have produced, on average, more than three eggs per year compared to 1.7 eggs per year previously. Nestling mortality has also fallen from 40% to 9.6%.

In order to counteract the shortage of natural tree-holes and provide more secure alternatives to the nest sites available a total of 63 nestboxes have been erected to date. These are readily used by Magpie Robins. Fitting broad polythene strips above and be-

low boxes will deter most climbing reptiles. Boxes are now used for approximately 50% of all nesting attempts. The fledging rate from eggs laid in boxes is 10% higher than in other sites but, more significantly, only 17% of nests in boxes are abandoned before laying while 31% of nests begun in coconut crowns never reach the egg stage because of disturbance. Nest predation by Indian Mynas continues to be a problem and measures are regularly taken to control numbers of this abundant introduced species which also competes with Magpie Robins for nest sites and, to some extent, for food.

There is strong circumstantial evidence that the high adult mortality found among Magpie Robins on Fregate in the early years of the recovery programme may have been at least partly attributable to the birds eating insects killed by household pesticides and simply swept out of dwellings. In 1991 agreement was reached with the island management that insecticide sprays would no longer be made generally available on Fregate. Birdlife International subsequently initiated trials with safe, hormone-based, insecticides which were supplied to island residents free of charge[4]. Since the implementation of the pesticide ban the annual adult mortality rate of Magpie Robins has dropped from an average of 20% to 3% in 1995. The reduced mortality and increased productivity achieved by the implementation of conservation measures had resulted in the growth of the world population of Seychelles Magpie Robins to 60 individuals by the end of 1995, an increase of 173% since the start of the project.

From the start of the recovery programme efforts have been made to clear substantial areas of dense, scrubby undergrowth from the woodland on Fregate using local labour. Where possible areas are being replanted with indigenous trees. More than 4,000 trees have been planted to date but this will take some time to bring significant benefit to the Magpie Robin population.

Translocations

The recent increase in Magpie Robin numbers on Fregate and the shortage of suitable habitat there has allowed the experimental translocation to three small islands free of mammal predators (Cousin, Cousine and Aride). Results from Cousin have been extremely encouraging. The two pairs introduced in November 1994 have since produced six offspring, all surviving, and a more recently transferred pair has also begun nesting. Supplementary feeding has proved unnecessary in Cousin's predominantly native woodland. Two male Magpie Robins have adapted well to conditions on neighbouring Cousine and it is likely that prospective mates will be moved from Fregate soon.

Transfers to Aride have, unfortunately, been less successful despite its vegetational similarity to Cousin and its record of having held a natural population of Magpie Robins into this century. Nine birds have been moved to Aride since 1992 but only two currently survive there. Both disease and predation, probably by introduced Barn Owls *Tyto alba*, have contributed to losses. Aride appears to present a more complex situation to that on Cousin. Research and habitat improvement are continuing and the lessons from the past setbacks are being assessed in an effort to refine procedures for future transfers to the island. Despite the problems eggs have recently been laid on Aride and hopes are high for successful breeding in the near future.

Seychelles Magpie Robin being loaded on to a helicopter for transport to Cousin Island, November 1994 (Adrian Skerrett)

Rat Threat

Despite the increase in numbers brought about by the recovery programme, the vulnerability of the Seychelles Magpie Robin was again emphasised in September 1995 when it was discovered that Fregate Island had been invaded by Brown Rats *Rattus norvegicus*. These appear to have gained access via boat cargo for the plantation and their arrival is a major setback for the project. Unless the rats can be eradicated quickly there is a danger that as their numbers increase they will turn to nest predation. Egg loss from other causes is already high and further pressure from rats would seriously endanger the Magpie Robins recovery. It is probable that incubating females and newly fledged juveniles would also be at risk. A poisoning and trapping programme is already underway but, while this appears to be exerting some control on the rat population, total eradication is unlikely unless substantial additional funding can be obtained. The dangers of secondary poisoning of birds during a full-

scale eradication campaign present serious logistical problems, however, and would make it necessary to remove a substantial number of Magpie Robins from the island or take them temporarily into captivity.

The Future

The Seychelles Magpie Robin population is now in a healthier state than it has been for several decades. Numbers on Fregate are the highest recorded and the species is now breeding again on other islands. However, the success of the last five years has yet to be consolidated. Problems remain. It is uncertain whether the rat threat on Fregate can be fully controlled. Nor can it yet be assessed quite how new tourism developments on Fregate will affect the birds. Landscaping associated with a new hotel on the island has the potential to make a significant contribution to habitat restoration if carried out sympathetically, but much of the plan remains unclear. The potential for re-introductions of Magpie Robins to other islands has been demonstrated but suitable predator-free islands are few and some may be too small to support self-sustaining populations. More resources are urgently needed for the removal of introduced species from islands which could provide refuges for native wildlife. The techniques and expertise needed to save the Seychelles Magpie Robin already exist. What is most needed, however, is commitment and long-term vision from all those involved in the conservation of this fascinating component of a unique avifauna. Much remains to be done but the outlook is optimistic and the project has demonstrated the potential of intensive management of wild populations as an initial tool in the conservation of critically endangered restricted-range species.

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